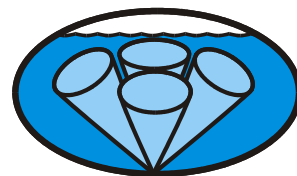
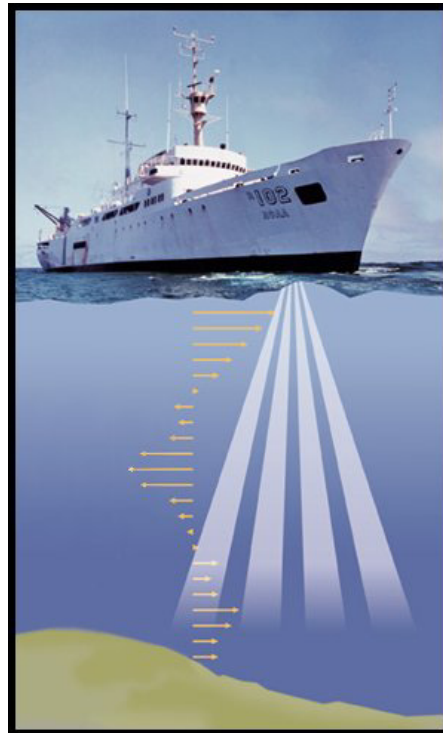


Ocean Surveyor Ocean Observer

User's Guide



RD Instruments

Acoustic Doppler Solutions

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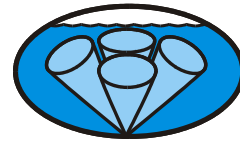
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NOTES



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Ocean Surveyor User's Guide

1 Introduction

Thank you for purchasing the RD Instruments (RDI) Ocean Surveyor or Ocean Observer. This guide is designed to help first time Ocean Surveyor/Observer users to set up and deploy their ADCP.

This guide is designed for use *with* the other Ocean Surveyor/Observer Technical Manual guides. Where needed, there are references to detailed information and figures contained in the Ocean Surveyor Technical Manual.

Ocean Surveyor/Observer deployments are Real-Time. Real-Time use refers to the fact you are viewing the data as the ADCP collects it via a personal computer. This data is also stored on the computer to allow for data playback and processing at a later time.

2 Ocean Surveyor Applications

Platform

RDI dominates the offshore oil and gas sector with field-proven instruments designed to facilitate exploration drilling, field development, and production. The Ocean Observer ADCP is usually installed on fixed platforms like deepwater drilling rigs for planning operations sensitive to ocean currents. This support is provided for station holding, riser deployment and monitoring, ROV surveys, ship loading, and anticipate and warn about extreme current conditions. Ocean Observer ADCPs remotely measure currents at many levels through the water column.

Vessel Mount

The Ocean Surveyor ADCP can be used to measure real-time current profiles of open ocean water current structures from permanent mountings in a vessel. These ADCPs provide detailed maps of the distribution of water currents and suspended materials through the water column and along the

ship's path. The Ocean Surveyor ADCP's low profile makes hull mounting an easier process and a more reasonable expense. In real time, the ADCP is also used to aid in-situ decision making, to adapt field operations, and to understand current regime characteristics. Vessel-mounted ADCPs have contributed to a large range of ocean projects, as diverse as the following:

- Gulf Stream climate studies
- Mid-ocean frontal mapping
- Fisheries research
- Deep-water cable-laying jobs

When considering vessel mount or platform real time applications, RDI offers you choices in software packages that are intended to directly meet your needs. *VmDas* is the most often used software package for ADCP setup, real-time data collection, and data review. For detailed information on how to use *VmDas*, see the [VmDas User's Guide](#).

3 System Overview

The Ocean Surveyor/Ocean Observer is designed for vessel-mount or fixed-mount current profile measurement in the upper ocean water from depths less than 100 meters. The system consists of a transducer and electronics chassis. The transducer housing is made from naval bronze and can be painted (with precautions) with anti-fouling paint. Data are transmitted in either an ASCII or binary format through the I/O cable.

3.1 Electronic Chassis Overview

The Ocean Surveyor Electronic Chassis (see [Figure 1](#) and [Figure 2, page 3](#)) contains all of the interfaces to and from the transducer, computer, vessel gyrocompass, and power.



Figure 1. Electronic Chassis Overview (Front View)

Power Switch – The power switch is a combination switch/circuit breaker. The power status LED next to the circuit breaker lights when power is applied to the electronic chassis.

LCD Display - The LCD Display shows the vessel's gyro heading.



NOTE. The Gyro Interface is optional. If you do not have a Gyro Interface board installed, the LCD display will be blank.

Up/Down/Set - Use the Up/Down/Set buttons to set the Gyro Offset for systems with the optional Gyro Interface board installed. The Offset Control buttons are Up, Set, and Down, as depicted by the upward arrow, the square box, and the downward arrow respectively.

For example, to set a heading offset for a multi-rate gyro, push the up or down button and set button simultaneously, using two small aids such as a pencil. When the desired offset is obtained, release the buttons. To prevent accidental re-adjustment, the buttons are recessed.

LEDs

- XMIT indicates the transducer is transmitting.
- TXD indicates data transmission from the Ocean Surveyor to the computer.
- RXD indicates data transmission from the computer to the Ocean Surveyor.
- BIT indicates a Built-In Test failure.

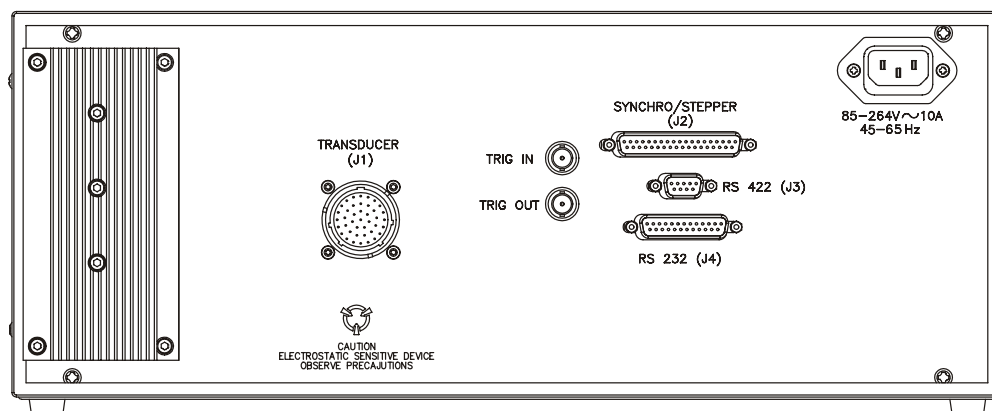


Figure 2. Electronic Chassis Overview (Rear View)

Transducer (J1) Connector – Input/Output (I/O) cable connects the Ocean Surveyor transducer to the Electronic Chassis.

Trigger Input/Output Connectors – The Trigger Input allows the Ocean Surveyor II to be pinged by an external +5V logic level signal. The minimum

duration for the Trigger Input is 1ms. The Input resistance is at least 2.7 k Ohm. The Trigger Output is a +5V logic level signal as well. The nominal source resistance of the Trigger Output is 50 Ohms.

The command that controls the Trigger Output and Input is *CXab*, where *a* controls the Trigger Input mode, and *b* the Trigger Output mode. For flexibility, several modes for the Trigger Input and Output operation have been implemented. See the [Command and Output Data Format book](#) for a description of the CX-command.

Synchro/Stepper (J2) Connector – Optional Gyrocompass (gyro) interface (J2) connects the ship's gyro to the electronics chassis.

Communications (J3 and J4) Connectors – Allows electronic chassis-to-ADCP communications in either RS-232 on the J4 connector (< 15 meter length I/O cable) or RS-422 on the J3 connector (> 15 meter length I/O cable).

Power In – The electronics chassis automatically scales the input voltage to the proper level. No special jumpers or switch settings are required to select the input voltage. The electronics chassis accepts input voltages of 90 to 250 VAC, 47 to 63 Hz. This input voltage is converted to 48 VDC by the chassis power supply. This is the voltage supplied to the power assembly board. For details on power requirements, see the [Installation Guide](#).

3.2 Transducer Overview

The transducer assembly contains the transducer ceramics and electronics. Standard acoustic frequencies are 38, 75, and 150kHz. See the outline drawings in the [Installation Guide](#) for dimensions and weights.

I/O Cable Connector – Input/Output (I/O) cable connects the Ocean Surveyor transducer to the Electronic Chassis.

Beam-3 Mark – The Beam-3 mark shows the location of Beam-3 (Forward).

Urethane Face – The urethane face covers the transducer ceramics. Never set the transducer on a hard surface. The urethane face may be damaged.

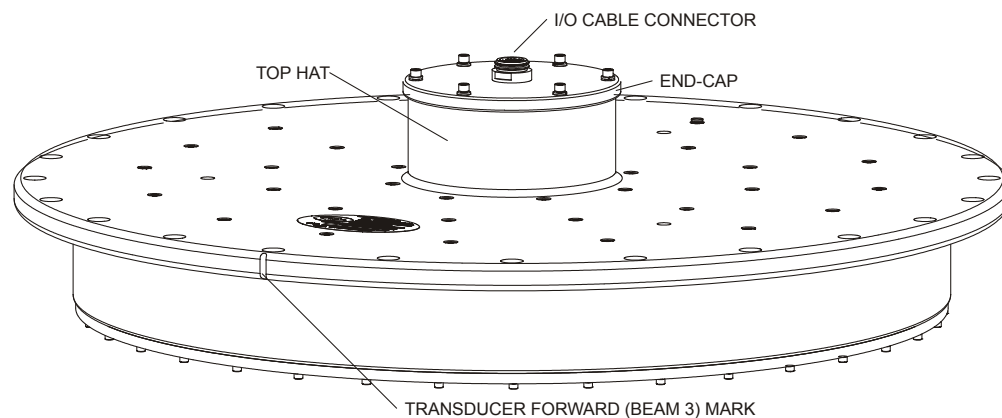


Figure 3. Transducer Overview (38 kHz Round Transducer Shown)

3.3 I/O Cable Overview

The I/O cable connects the Ocean Surveyor transducer to the Electronics Chassis.

Cable specifications:

- Minimum bend radius = 203 mm (8.0 in.)
- Typical cable OD = 19.8 mm (0.78 in.)
- Maximum pull load = 1132 N (250 lb.)
- Maximum length = 100 m (328 ft.)
- Available with either ends having straight or angled connectors or a combination thereof.

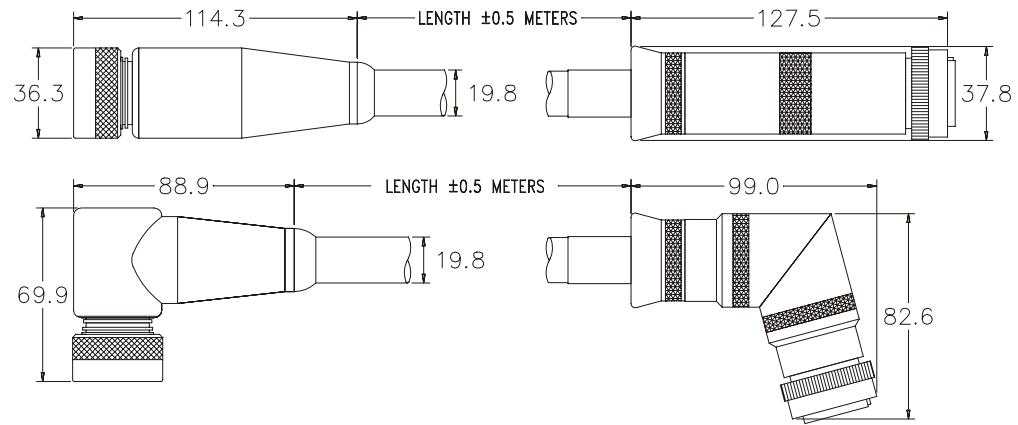


Figure 4. I/O Cable

3.4 Spare Parts

The following parts are included in the spare parts kit.

Table 1: Spare Parts

Item ID	Description	Where Used
2-020-70SH-EP	O-ring	End-Cap/Top Hat connector
2-022-70SH-EP	O-ring	I/O Cable
DC-111	Lubricant, silicone	O-ring lubricant
314025	Fuse, 25A Fast blow, 3AB	Power Interface PCB
M4x0.7x6PH	Screw, pan head, SST	Electronic Chassis cover

4 Ocean Surveyor/Observer Care

This section contains a list of items you should be aware of every time you handle, use, or deploy your Ocean Surveyor/Observer. *Please refer to this list often.*

4.1 General Handling Guidelines



CAUTION. Do NOT ping the Ocean Surveyor with the transducer in air. The power assembly board will short, causing the electronics chassis to no longer communicate. The transducer is pinged by sending a CS or PT5 command or if *VmDas* is started for collecting data – either of these methods will cause damage if the transducer is in air.

- Never set the transducer on a hard or rough surface. The urethane face may be damaged.
- Do not expose the transducer to prolonged sunlight. The urethane face may develop cracks. Cover the transducer face on the Ocean Surveyor/Observer if it will be exposed to sunlight.
- Do not scratch or damage the O-ring surfaces or grooves. All O-ring grooves and surfaces must be inspected for scratches or damages on every re-assembly. If scratches or damage exist, they must be sanded out using 400 to 600 grit sandpaper. If the damage cannot be repaired, contact RDI. Do not risk a deployment with damaged O-ring surfaces.
- Do not lift or support an Ocean Surveyor/Observer by the external I/O cable. The connector or cable will break.

4.2 Assembly Guidelines

- Always check that the I/O cable (wet end) O-rings are in place when connecting the I/O cable to the transducer. These O-rings have a tendency to fall out if the cable connector is dropped.
- Read the [Maintenance guide](#) for details on Ocean Surveyor/Observer re-assembly. Make sure the top hat assembly O-rings stay in their groove when you re-assemble the Ocean Surveyor/Observer. Tighten the Top Hat hardware as specified. Loose, missing, or stripped Top Hat mounting hardware or damaged O-rings can cause the Ocean Surveyor/Observer transducer to flood.

4.3 Deployment Guidelines

- Read the *VmDas* User's Guide. This guide has a tutorial to help you learn how to use the ADCP.
- Use the default Command Files (included on the *VmDas* CD) to help setup the ADCP.

5 Software

RDI has utility programs to help you set up, use, test, and trouble-shoot your Ocean Surveyor/Observer ADCP. Each program has a help file that you can print, or you can view help while running the program.

Table 2: Ocean Surveyor/Observer Software Main Modules

Program Name	Description
<i>VmDas</i>	<i>VmDas</i> is a software package for data collection, reprocessing, and replay. For detailed information on how to use <i>VmDas</i> , see the VmDas User's Guide .
<i>BBTalk</i>	Windows ADCP communication program. Use this program to "talk" to the ADCP and to run test script files. <i>BBTalk</i> is included on the RDI Tools CD. For detailed information on how to use <i>BBTalk</i> , see the RDI Tools User's Guide .
<i>WinADCP</i>	Gives users a visual display of the entire set of data. You can zoom in on a portion of the data for closer analysis and export data to text or MatLab files. For detailed information on how to use <i>WinADCP</i> , see the WinADCP User's Guide .
Documentation CD	The Documentation CD has an Adobe Acrobat® (*.pdf) electronic version of the Ocean Surveyor Technical Manual. Use the Documentation CD to search for information. For detailed information on how to use Adobe Acrobat® and the Documentation CD, see the Read This First guide .



NOTE. The RDI Tools CD also has other utility programs to supplement data processing.

5.1 System Requirements

The Ocean Surveyor/Observer software requires the following:

- Windows 95®, Windows 98®, Windows® NT 4.0 with Service Pack 4 installed, Windows 2000®, or Windows XP®,
- Pentium class PC 233 MHz (350 MHz or higher recommended)
- 32 megabytes of RAM (64 MB RAM recommended)
- 6 MB Free Disk Space (20 MB recommended)
- One Serial Port (two High Speed UART Serial Ports recommended)
- Minimum display resolution of 800 x 600, 256 color (1024 x 768 recommended)



NOTE. *VmDas* has special system requirements; see the *VmDas* User's Guide for details.

5.2 Software Installation

To install the Ocean Surveyor/Observer software, do the following.

- a. Insert the compact disc into your CD-ROM drive and then follow the browser instructions on your screen. If the browser does not appear, complete Steps “b” through “d.”
- b. Click the **Start** button, and then click **Run**.
- c. Type **<drive>:launch**. For example, if your CD-ROM drive is drive D, type **d:launch**.
- d. Follow the browser instructions on your screen

6 How to Contact RD Instruments

If you have technical problems with your instrument, contact our field service group in any of the following ways:

RD Instruments

9855 Businesspark Ave.

San Diego, California 92131

+1 (858) 693-1178

FAX +1 (858) 695-1459

Sales – rdi@rdinstruments.com

Field Service - rdifs@rdinstruments.com

RD Instruments Europe

5 Avenue Hector Pintus

06610 La Gaude, France

+33(0) 492-110-930

+33(0) 492-110-931

rdi@rdieurope.com

rdifs@rdieurope.com

Web: www.rdinstruments.com

The industry leader in Customer Support has just raised the bar another notch. RD Instruments introduces the After-Hours Emergency Service. When the RDI-US and RDI-Europe office is closed, customers may now call +1 858-578-0781 to have their after-hours emergencies resolved.

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